

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method for determining positional relationships among objects represented in a database, the method comprising:

defining a plurality of tiles in a spatial index in the database;

~~determining a distribution of the objects with respect to the tiles by~~

identifying ~~as interior tiles~~ those tiles that intersect ~~[[the]]~~ an object while all of a boundary of the object lies outside the ~~interior~~ tiles and by identifying ~~as boundary tiles~~ those tiles that intersect a boundary of the object;

~~identifying a first object as fulfilling a primary filter condition with respect to a second object if~~ comparing tiles of a first object with tiles of a second object to determine whether at least one tile of the first object intersects with at least one tile of the second object; and

~~identifying the first object as fulfilling a secondary filter condition with respect to the second object if~~ determining whether the at least one tile of the second object with which the at least one tile of the first object intersects is ~~an interior tile of the second object~~ a tile that intersects the second object while all of the boundary of the second object lies outside the tile.

2. (cancelled)

3. (cancelled)

4. (currently amended) The method according to claim 1, wherein ~~the primary filter condition~~ a positional relationship among objects includes at least one member selected from the group comprising:

a first object in a second object,

a second object contained by a first object,

a first object in a second object where a boundary of the first object intersects a boundary of the second object,

a first object covering a second object where a boundary of the first object intersects a boundary of the second object,

a first object outside a second object where a boundary of the first object intersects a boundary of the second object,

a first object does not cover a second object where a boundary of the first object intersects a boundary of the second object,

a first object overlaps a second object but the boundaries of the first object and the second object do not touch,

a first object overlaps a second object and the boundaries of the first object and the second object touch,

a first object is equivalent to a second object, and

a first object is disjoint from a second object.

5. (cancelled)

6. (cancelled)

7. (original) The method according to claim 1, wherein the tiles all have at least one of the same size and the same shape.

8. (original) The method according to claim 7, wherein the tiles are rectangular.

9. (original) The method according to claim 1, wherein the tiles have different sizes.

10. (currently amended) The method according to claim 1, wherein the database comprises ~~geometries of the objects~~ objects on a surface or in a three-dimensional space.

11. (currently amended) The method according to claim 10, wherein the database stores ~~the exact~~ representations of the objects and ~~approximations of the geometries~~ approximate representations of the objects.

12. (currently amended) The method according to claim 1, wherein ~~geometries~~ the objects comprise polygons and the method determines positional relationships among polygons.

13. (currently amended) The method according to claim 11, wherein the ~~geometries~~ the objects comprise linestrings and polygons and the method determines positional relationships among the polygons.

14. (original) The method according to claim 13, wherein the linestrings represent streets and the polygons represent a geographic region, and the method determines streets that at least partially fall within the geographic region.

15. (original) The method according to claim 14, wherein the geographic region includes a member selected from the group comprising counties, cities, and zip code regions.

16. (cancelled)

17. (previously presented) The method according to claim 1, wherein the objects are organized with a linear quadtree index.

18. (currently amended) The method according to claim 1, wherein the ~~secondary filter condition~~ step of determining whether the at least one tile of the second object with which the at least one tile of the first object intersects is an interior tile of the second object is applied only to ~~a subset of objects fulfilling the primary filter condition~~ wherein at least one tile of the first object intersects with at least one tile of the a second object.

19. (currently amended) The method according to claim 1, further comprising:

assigning each tile, a tile code and an associated ~~geometry~~ object as the tiles are defined.

20. (currently amended) A computer program product for performing a process for determining positional relationships among objects represented in a database in a computer system, comprising:

a computer readable medium; and

computer program instructions, recorded on the computer readable medium, executable by a processor, for performing the steps of

defining a plurality of tiles in a spatial index in the database;

~~determining a distribution of the objects with respect to the tiles by~~

~~identifying as interior tiles those tiles that intersect [[the]] an object while all of a~~

~~boundary of the object lies outside the interior tiles and by identifying as boundary~~

~~tiles those tiles that intersect a boundary of the object;~~

~~identifying a first object as fulfilling a primary filter condition with respect~~

~~to a second object if~~ comparing tiles of a first object with tiles of a second object

to determine whether at least one tile of the first object intersects with at least one tile of the second object; and

~~identifying the first object as fulfilling a secondary filter condition with~~

~~respect to the second object if~~ determining whether the at least one tile of the

second object with which the at least one tile of the first object intersects is ~~an~~

~~interior tile of the second object~~ a tile that intersects the second object while all of

the boundary of the second object lies outside the tile.

21. (currently amended) A system for performing a process method for determining positional relationships among objects represented in a database, comprising:

a processor operable to execute computer program instructions; and

a memory operable to store computer program instructions executable by the processor, for performing the steps of:

defining a plurality of tiles in a spatial index in the database;

~~determining a distribution of the objects with respect to the tiles by~~

~~identifying as interior tiles those tiles that intersect [[the]] an object while all of a boundary of the object lies outside the interior tiles and by identifying as boundary tiles those tiles that intersect a boundary of the object;~~

~~identifying a first object as fulfilling a primary filter condition with respect to a second object if~~ comparing tiles of a first object with tiles of a second object to determine whether at least one tile of the first object intersects with at least one tile of the second object; and

~~identifying the first object as fulfilling a secondary filter condition with respect to the second object if~~ determining whether the at least one tile of the second object with which the at least one tile of the first object intersects is ~~an interior tile of the second object~~ a tile that intersects the second object while all of the boundary of the second object lies outside the tile.

22. (currently amended) The method of claim 1, further comprising the steps of:

~~determining whether the first object fulfills a secondary filter condition with respect to the second object by exactly comparing a geometry of the first object with a geometry of the second object if none of the tiles of the second~~

object that intersect with the at least one tile of the first object is ~~an interior tile of the second object~~ a tile that intersects the second object while all of the boundary of the second object lies outside the tile.

23. (currently amended) The computer program product of claim 20, further comprising the steps of:

~~determining whether the first object fulfills a secondary filter condition with respect to the second object by exactly comparing a geometry of the first object with a geometry of the second object if none of the tiles of the second object that intersect with the at least one tile of the first object is an interior tile of the second object~~ a tile that intersects the second object while all of the boundary of the second object lies outside the tile.

24. (currently amended) The system of claim 21, further comprising the steps of:

~~determining whether the first object fulfills a secondary filter condition with respect to the second object by exactly comparing a geometry of the first object with a geometry of the second object if none of the tiles of the second object that intersect with the at least one tile of the first object is an interior tile of the second object~~ a tile that intersects the second object while all of the boundary of the second object lies outside the tile.